Australian Bureau of Statistics

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THE SNOWY MOUNTAINS HYDRO-ELECTRIC SCHEME

1. GEOGRAPHY OF AREA

The Snowy country in south-eastern New South Wales is the only part of the continent in which any altitudes exceed 7,000 feet, and in which there is a substantial area over the altitude of 6,000 feet. The precipitation which results from the presence of this barrier on the line of the prevailing winter depressions of Antarctic origin amounts to as much as 120 inches a year in the vicinity of Mt. Kosciusko, the highest point in Australia. The drainage from the snowfields is practically all to three. systems - those of the Murray and Murrumbidgee Rivers, which flow inland, and that of the Snowy, which flows southwards to Bass Strait.

See also Chapter X1.-Water Conservation and Irrigation 3. para. 4. For more detailed information *see* special article by the Commissioner, Snowy Mountains Hydro-electric Authority (Sir William Hudson), which appears below this article.

2. HISTORICAL

The Murray and Murrumbidgee have been subject to control and intensive development for irrigation for many years; the Snowy, however, flows through mountainous and practically uninhabited country until debouching onto the river flats of East Gippsland, not many miles above its mouth. It has never been controlled in any way, either for the production of power or for irrigation, and a great proportion of its waters flow to waste into the sea. As a result, attention has long been directed towards this river, which has the highest source of any in Australia and which conducts away a large proportion of the waters from the south-eastern New South Wales snowfields, and it has been consecutively considered as a means of supplementing the flow of the great inland rivers, a source of water supply to the rapidly growing metropolitan area of Sydney, a means for developing hydro-electric power and, again, as a source of increasing agricultural production in the rich Murray and Murrumbidgee valleys.

The 1939 - 45 War, and the plans for post-war reconstruction which then originated, led to a proposal by the State of New South Wales for diversion for irrigation and agricultural purposes of the waters of the Snowy to the Murrumbidgee River - a scheme in which little emphasis was placed on the generation of power. The Victorian Government proposed a counter-scheme, involving very much greater generation of power, and involving diversion, not to the

Murrumbidgee, but to the Murray.

The Commonwealth Government, however, being seized with the national implications of these proposals, brought about a meeting in 1946 of Commonwealth and State representatives to discuss the general utilization of Snowy waters, and subsequently a Committee was set up to examine the whole question on the broadest possible basis. This Committee, in a report submitted in November, 1948, suggested consideration of a far greater scheme than any previously put forward. It involved not only the simple question of utilization of the waters of the Snowy, but a general consideration of the possible diversion of a number of rivers in the area, tributaries, not only of the Snowy, but of the Murray and Murrumbidgee. The recommendations of the Committee were generally agreed to by a conference of Ministers representing the Commonwealth and States of New South Wales and Victoria, and it was also agreed that the Committee should continue its investigations. A further report was submitted by the Committee in June, 1949, as a result of which the Commonwealth Parliament passed the Snowy Mountains Hydro-electric Power Act. In the next month the Snowy Mountains Hydro-electric Authority was constituted, and thus was inaugurated the greatest engineering scheme in Australian history.

3. DESCRIPTION OF SCHEME

(i) **General**. The proposals at present being implemented fall into two groups, Tumut Development and Snowy-Murray Development - each having its associated plans for hydro-electric power production. The features described here under may be identified by reference to the map on page 397. It should be remembered that, as the final designs for practically every element of the scheme have not yet been completed, and in many cases will not be completed for many years, any figures which are now quoted in respect of those elements will undoubtedly be subject to modification in the future.

(ii) **Tumut Development**. The central feature of this part of the plan is diversion to, and regulation of, the waters of the Tumut River, a stream at present completely unregulated, but which contributes approximately half of the flow of the Murrumbidgee River at Gundagai below the existing main storage on the Murrumbidgee at Burrinjuck. To the Tumut will be diverted the waters of the Eucumbene, a major tributary of the Snowy, and the headwaters of the Tooma, a tributary of the Upper Murray. The headwaters of the Murrumbidgee itself will also be diverted to the Tumut, principally to secure desirable electric power.

A major dam is being constructed on the Eucumbene River at Adaminaby, creating a storage of at least 3.5 million acre feet, and from this, water will be conveyed by a 14-mile tunnel to Tumut Pond on the upper reaches of the Tumut River, where it will be joined by the waters from the Tooma, diverted by aqueducts and tunnels. From Tumut Pond another tunnel will convey the water to power station T.1 with an installed capacity of about 320,000 kW and a further tunnel to power station T.2 with a capacity of 280,000 kW thence discharging into a smaller storage at Lob's Hole.

As originally planned the waters of the Upper Murrumbidgee were to be brought to the Lob's Hole Reservoir from another major storage at Tantangara, holding 480,000 acre feet by tunnel to power station T.3 with an installed capacity of 150,000 kW, discharging into a pond on the Yarrangobilly River, a tributary of the Tumut, and from Yarrangobilly Pond by further tunnel to power station $T._4$ with an installed capacity of 150,000 kW which, in turn, would discharge into the Lob's Hole Reservoir. This part of the scheme has been temporarily abandoned and the waters to be stored at Tantangara will now be diverted to the Adamina by storage through nine miles of tunnel.

Between the foot of the Lob's Hole storage and the top of the Blowering storage will be power stations *T.5* and T.6. The total capacity of these stations will be 410,000 kW.

The Blowering storage with its capacity of about 860,000 acre feet, is an adjunct to the Snowy Mountains Hydro-electric Scheme and will be required for the regulation both of the Tumut waters and of the waters diverted into the Tumut. This regulation is essential if the waters impounded are to be fully utilized for irrigation purposes. At the foot of the Blowering Dam will be the last of the Tumut Power stations, $T._7$, with a capacity of some 60,000 kW, but this station will operate only when water is released for irrigation. The State of New South Wales will be responsible for the construction of the Blowering works.
The total extra new water which will reach the Murrumbidgee is expected to average 528,000 acre feet per annum and the total installed capacity of the various power stations is estimated at 1,310,000 kW (excluding T.7).

(iii) **Snowy - Murray Scheme**. The central feature of this part of the scheme is the diversion of the waters of the Upper Snowy itself from a major dam to be constructed at Jindabyne on that river, a little below its junction with the Eucumbene and the Orackenback Rivers. This reservoir will have a storage capacity of approximately I,100,000 acre feet and from it a tunnel approximately 28 miles in length will run right through the Great Dividing Range finally discharging into Swampy Plains River, not far above its junction with the Murray proper.

Into this tunnel will be collected a considerable quantity of water from the very high altitude country of the Kosciusko area, and from a number of smaller tributaries of the Murray. The collection from the Kosciusko area commences at the Kosciusko Reservoir at an altitude of 5,725 feet not many miles below the source of the Snowy. A tunnel will convey water from this reservoir to power station M.i.A. with an installed capacity of 60,000 kW and thence to a pond on the Snowy River, at its junction with the Guthega River.

From the Guthega Pond, a further tunnel and penstock lead to station M.1.B. with a capacity of 60,000 kW (ultimate capacity 90,000 kW), which discharges into a pond at the junction of the Munyang and Snowy Rivers. Construction of this part of the scheme has been completed. Munyang Pond will discharge into a tunnel leading to station M.2.L., with installed capacity of 60,000 kW. This station also receives the flow of a tributary of the Snowy River via station M.2.H. From station M.2.L. the water discharges into a reservoir at Island Bend on the main stream of the Snowy.

From the Island Bend reservoir, a vertical shaft, I,100 feet deep, will lead to the main tunnel from Jindabyne reservoir previously referred to, passing on its way through power station M.3 with installed capacity of 265,000 kW. Into this main tunnel will also be collected waters from the Upper Murray tributary streams previously mentioned.

Of these, the most important is the Windy Creek - Geehi River series. A pond on Windy Creek, a small tributary of the Geehi, situated at an altitude of over 5,000 feet, will provide water through a tunnel to station $M._4$ with an installed capacity of 75,000 kW thence by aqueducts and tunnel to station M.5.H. with an installed capacity of 40,000 kW discharging into the M.5.L. Intake Pond on the Geehi River.

A vertical shaft will lead this water into the main tunnel, passing through station M.5.L with an installed capacity of 20,000 kW. The combined waters thus collected into the main tunnel will pass through station M.6 with an installed capacity of 540,000 k.W and then discharge into a pond on Bogong Creek, another of the Upper Murray tributaries. At this point, the water is still at an altitude of nearly 2,000 feet, and the main tunnel will thence continue to station M.7 with a capacity of 540,000 kW.

From M.7 the total collected waters will flow into the Swampy Plains River at a point some seven miles, in a direct line, above its confluence with the Murray. It will be necessary, however, to provide on the Murray a further storage for the proper regulation of these waters for irrigation purposes

From M.7 the total collected waters will flow into the Swampy Plains River at a point some seven miles, in a direct line, above its confluence with the Murray. It will be necessary, however, to provide on the Murray a further storage for the proper regulation of these waters for irrigation purposes.
The total water flowing to the Murray from these works will amount on the average to 722,000 acre feet per annum, but as 280,000 acre feet which now reaches the Murray from the Tooma will be, as indicated previously, diverted to the Tumut, the total extra water actually reaching the Murray will be,on the average 442,000 acre feet per annum to the total installed capacity of the power stations will be 1,700,000 kW.

An integral part of each development is the construction of hundreds of miles of aqueducts to collect and divert water from the many streams in the area into storages and tunnels.

4. UTILISATION OF POWER

The total capacity of all stations in the scheme will be of' the order of 3,000,000 kW, which is only slightly less than the present total installed capacity of all the generating stations in the Commonwealth.

If, however, the demand for power continues to increase as is expected, the major source of power must still be thermal stations. The operation of the whole scheme ii. dependent on the appropriate development and integration of these stations, as otherwise there would be a serious loss in ultimate economy; all economic estimates therefore postulate that thermal capacity will he expanded so as to preserve an appropriate ratio.

It has been estimated with a reasonable degree of probability that the power available from the scheme will save coal to the order of five million tons annually.
The first call on the power generated under the Snowy Scheme will be by the Commonwealth Government for supply to the Australian Capital Territory of power which it needs in that area, particularly for certain projects with defence significance. and no indication can at present be given as to how great that call will be. It is not likely, however, to amount to more than a relatively small fraction of the total power available, and it has been agreed that the balance will he divided between the States of New South Wales and Victoria in a proportion of two-thirds to New South Wales and one-third to Victoria.

The first power station in the scheme, M.1.B., the Guthega Project, is now producing power. A 132,000 volt transmission line extends from the power station via Cooma to the Australian Capital Territory where it joins into the main New South Wales transmission network. The construction of the Eucumbene-Tumut diversion tunnel, Tumut Pond Dam and Power Station T.i is in progress. Adamina by Dam is in course of construction by the Public Works Department of New South Wales on behalf of the Authority. Power Station T.i will enter the New South Wales network via a 330,000 volt transmission line early in 1959**.**

1. General. - In Official Year Book No. 39 an account is given in some detail of the origin and development of electricity generation and distribution in New South Wales, describing in particular the growth of the systems of the Sydney County Council, the Department of Railways, the Electric Light and Power Supply Corporation Ltd., the Southern Electricity Supply and the Clarence River County Council (now the Northern Rivers County Council). A description is also given of the legislation existing prior to, and that which constituted, the Electricity Authority of New South Wales and the Electricity Commission of New South Wales. At present, the three main Acts governing electricity supply in New South Wales are:-

(i) The Local Government Act 1919 which lays down the various rights and responsibilities of local government bodies in the establishment and operation of electricity trading undertakings.

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(This special article has been contributed by the Snowy Mountains Hydro-electric Authority)

In April 1966 the first diversion of water was made from the Snowy River to the Murray River, one of the many milestones in the Snowy Mountains Scheme. Twenty years later this article looks back at the development, construction and performance of the Scheme.

GENERAL DESCRIPTION

The Snowy Mountains Scheme is a dual purpose hydro-electric and irrigation complex located in south-eastern Australia. It impounds the south-flowing waters of the Snowy River and its tributary, the Eucumbene. at high elevations and diverts them inland to the Murray and Murrumbidgee Rivers, through two tunnel systems driven through the Snowy Mountains. The Scheme also involves the regulation and utilisation of the headwaters of the Murrumbidgee, Tumut, Tooma and Geehi Rivers.

The diverted water, together with regulated flows in the Geehi and Tumut River catchments, generates mainly peak-load electricity for the States of New South Wales and Victoria and the Australian Capital Territory, as the water passes through power stations to the irrigation areas inland from the Snowy Mountains. The Scheme reached its designed capacity in 1974 after twenty-five years of construction.

FEATURES OF THE SCHEME

- Sixteen large dams
- 80 km of aqueducts
- Over 145 km of tunnels
- A pumping station
- Five surface and two underground power stations which provide:

(a) a generating capacity of 3 740 MW: and

(b) 2 360 GL annually of water for irrigation in the Murray and Murrumbidgee rivers.

Broadly, the Scheme falls into two sections: the northern. Snowy-Tumut development; and the southern, Snowy-Murray development. Both developments are connected by tunnels to the Scheme's main regulating storage, Lake Eucumbene on the Eucumbene River.

SNOWY-TUMUT DEVELOPMENT

The Snowy-Tumut development provides for the diversion of the Eucumbene, the Upper Murrumbidgee and the Tooma Rivers to the Tumut River, and for the combined waters of these

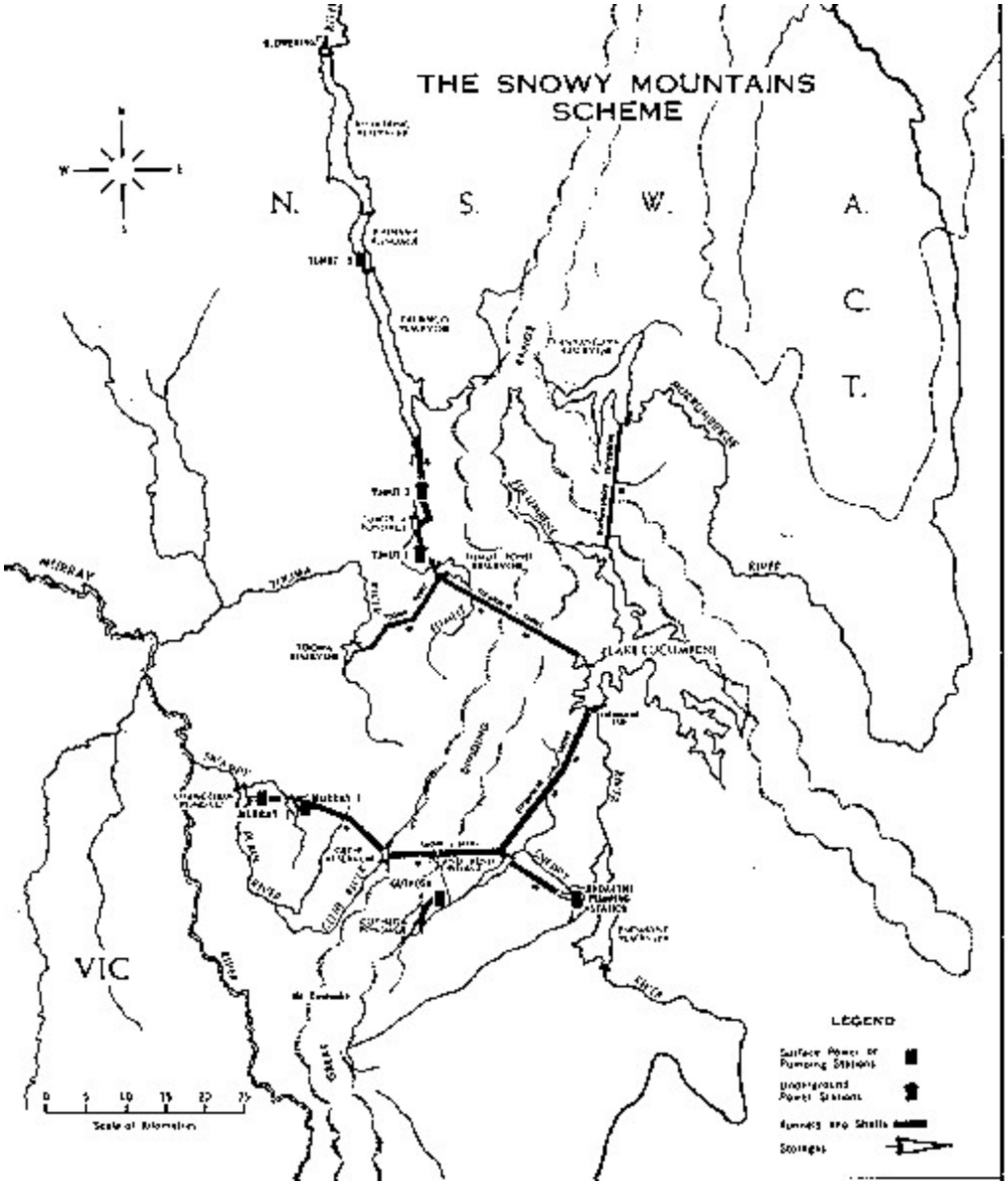
four rivers to generate electricity in four power stations (Tumut 1, Tumut 2, Tumut 3 and Blowering) in their fall of 800 m before release to the Tumut River and thence to the Murrumbidgee River.

The transmountain tunnel system includes the Eucumbene-Tumut tunnel, connecting Lake Eucumbene with Tumut Pond reservoir. The normal function of the tunnel is to divert water through the Great Dividing Range from Lake Eucumbene to the Tumut River, but during periods of high flow in the Tumut and Tooma Rivers, water in excess of that required for operating the power stations along the Tumut River is diverted in a reverse direction through the tunnel to Lake Eucumbene for storage.

The total installed capacity in Tumut 1, Tumut 2, Tumut 3 and Blowering Power Stations is 2 180 MW. This section of the Scheme enables I 380 GL of additional water to be provided over a year to the Murrumbidgee River. This water has enabled irrigation production to be increased and new areas to be developed in the Murrumbidgee Valley.

SNOWY-MURRAY DEVELOPMENT

The Snowy-Murray development involves the diversion of the Snowy River, by a transmountain tunnel system, to the Geehi River, the diverted waters falling some 800 m and generating up to 1 500 MW in Murray 1 and Murray 2 Power Stations. Additional power is generated in the 60 MW Guthega Power Station which makes use of the rapidly falling water of the Upper Snowy River on the east of the Divide before it reaches the main tunnel system at Island Bend


THE SNOWY MOUNTAINS SCHEME
N.
S.
W.
A.
C.
T.
VIC
MURRAY
TUMUT 3
TUMUT 2
TUMUT 1
LAKE EUCUMBENE
ADAMINABY
KHANCOBAN
MURRAY 1
ALBURY
GUTHEGA
JINDABYNE
MT. KOSCIUSKO
LEGEND
Surface Power or Pumping Stations
Underground Power Stations
Tunnels and Shafts
Storages

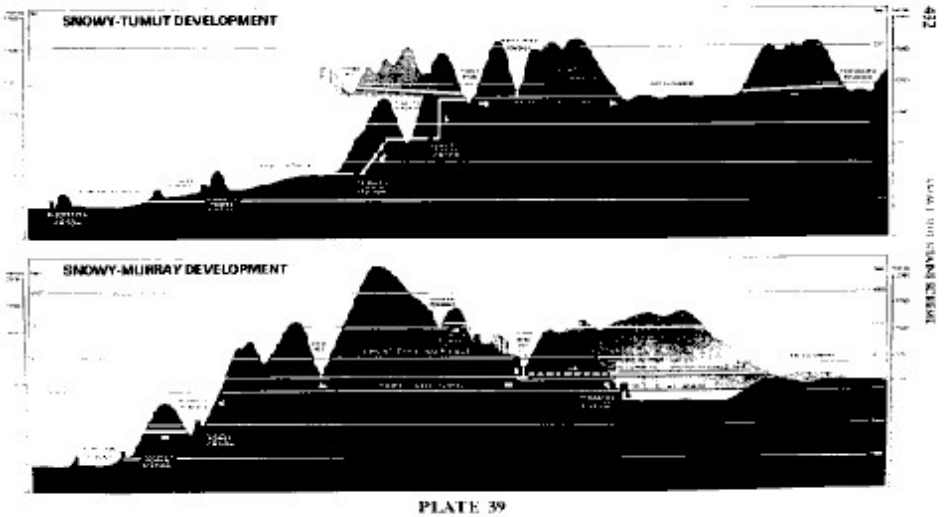

SNOWY-TUMUT DEVELOPMENT
SNOWY-MURRAY DEVELOPMENT

PLATE 39

An essential part of this development is the two-way Eucumbene-Snowy tunnel which connects the Snowy River with Lake Eucumbene. When the flows in the Snowy and Geehi Rivers exceed the needs of the Murray Power Stations, water from the Snowy River at Island Bend is diverted through this tunnel for storage in Lake Eucumbene. Low flows in the Snowy and Geehi Rivers are supplemented by diverting the stored water from Lake Eucumbene back through the same tunnel and delivering it to the transmountain tunnel system leading to the Murray power stations.

Additional water is supplied to the transmountain tunnel system near Island Bend by the Jindabyne project which pumps, from Lake Jindabyne, the run-off from the Snowy catchment downstream of Island Bend.

The Snowy-Murray Development enables 980 GL of additional water to be provided over a year, through the Hume Reservoir, to the Murray River for irrigation in the Murray Valley.

CONSTRUCTION

In 1947, a Committee of State and Commonwealth officers was formed to examine the development of the water resources of the Snowy Mountains area in the broad national interest. This followed previous single purpose proposals for using some of these resources which dated back to the early 1880s.

The Commonwealth Government passed the Snowy Mountains Hydro-electric Power Act in 1949 which gave the Snowy Mountains Hydro-electric Authority the responsibility for the final investigation, design and construction of the Snowy Mountain Scheme, one of the largest single engineering works ever to be undertaken in Australia up to that time. The enterprise was established as 'a milestone towards full national development' and in serving the dual purpose of satisfying the need for increased generating capacity following World War 11 and diverting the Snowy River inland to the dry west was greeted with enthusiasm by the people of Australia.

One of the earliest tasks of the Authority was to obtain detailed survey, hydrological and geological information in steep, mountainous terrain. The analysis of this information together with advances in technology and the higher than anticipated growth in demand for electricity led to changes to the Scheme as originally proposed by the Commonwealth-States Committee. The main diversion of Snowy River water to the Murray River was made at a higher level as a consequence of the availability of dam sites and a pumping station was installed at Jindabyne for diversion of water from its lower reaches. A pumped storage project was incorporated at Tumut 3 and a number of proposed power stations were incorporated into single larger stations. In all there was a reduction in the number of power stations from 16 as originally proposed to 7 and an increase in generating capacity from 2 820 MW to 3 740 MW.

Besides the gathering of technical data, the early problems of the Authority were the establishment of stores, workshops, laboratories, offices and accommodation. Initially building materials needed to be brought from overseas in meeting priorities for post war construction. Communications needed to be developed over the area as well as road systems, camps and townships. Some 1600 km of roads were constructed and townships and main camps established at over 100 locations. Community services and amenities were also a need for the construction and associated forces which numbered over 7,300 personnel at the peak of construction in 1959.

Initially, the design of major works was undertaken by the United States Bureau of Reclamation while appropriate staff were recruited from within Australia and overseas and younger engineers were trained by the Bureau.

In the early projects of the Scheme a major change was made in the construction management of large civil engineering works. Whereas works had been traditionally constructed by day labour in Australia, the contractual system was adopted. This led to the introduction into Australia of large overseas firms which has no doubt been of great benefit to construction in Australia. Overseas contractors using Australian and New Australian labour surpassed previous world tunnelling records on many occasions. Electrical and mechanical plant was also supplied by contract to Authority specifications and at the time of construction, certain features of the Murray 1 and Tumut 3 Power Stations were of the largest attempted in the world.

Significant advances were also made in the use of rock bolts to reduce concrete lining of tunnels and underground structures.

Throughout construction a high standard of safety measures was employed and construction was renowned for the lack of industrial disputes. Undoubtedly, much of the credit for the construction of the Scheme was due to the leadership of the late Sir William Hudson K.B.E. who was Commissioner of the Authority from 1949 to 1967.

Although the Scheme was constructed at a time when the question of the effect of public works on the environment was not such a public issue as it is today this is not to say, however, that environmental aspects were not considered during design and construction. A high priority was given to soil conservation techniques and significant achievements were made in this field as well as in the protection of natural assets of the area. Under present conditions, when major environmental impact statements would be required, progress on the Scheme could have been delayed while some of the issues were resolved.

Generation commenced from the Scheme in February 1955 with the completion of the 60 MW Guthega project; and Eucumbene Dam, providing the main storage for the Scheme, was completed in May 1958.

The first transmountain diversion of water via the Eucumbene-Tumut Tunnel to the Tumut River was made in June 1959. On 1 May 1962, the Upper Tumut Works were declared in full operation marking the completion of the Tumut 1 and 2 Power Stations (600 MW), the Tooma-Tumut and Murrumbidgee-Eucumbene Diversions and the accumulation of sufficient water in Lake Eucumbene to provide regulation of water over dry periods.

Blowering Dam, which was constructed by the Authority for the State of New South Wales to regulate releases from the Scheme to the Tumut River for irrigation, came into service in May 1968 and the 80 MW Blowering Power Station began operation in August 1971. In April 1966 the first diversion of water was made from the Snowy River to the Murray River with the commissioning of the first two units at Murray 1 Power Station, and the Snowy-Murray Development was declared in full operation on 1 July 1970.

The Scheme reached its designed capacity of 3,740 MW in August 1974 when the last unit of the 1,500 MW Tumut 3 project was brought into service.

SNOWY MOUNTAINS HYDRO-ELECTRIC POWER ACT

This Act, passed in 1949, established the Snowy Mountains Hydro-electric Authority, and empowered it to provide hydro-electric works in the Snowy Mountains Area. The Authority was also empowered to supply electricity to the Commonwealth Government (i) for defence purposes, (ii) for consumption in the A.C.T. and (iii) to supply to a State, or to a State Authority, electricity not required for defence purposes or for consumption in the A.C.T.

Certain resolutions were adopted in July 1949 between Ministers of the Commonwealth and

States with respect to the development and use of the water resources of the area for the generation of electricity, for the provision of water for irrigation and the sharing of water between the States. However, it was not until August 1959 when works of the Scheme were well advanced that a detailed Agreement between the States of NSW and Victoria and the Commonwealth Government was incorporated in the Act and joint legislation enacted by the States with regard to the construction and operation of the Scheme, the distribution of power and water, charges to be made for electricity and other such matters.

The Agreement also resolved differing opinions as to the constitutional powers of the Commonwealth Government with regard to the water resources of the Snowy Scheme. Under the provisions of the agreement the Commonwealth Government made a reservation of 670 GWh from the energy output of the Scheme of just over 5,000 GWh per annum, the remainder being shared between the States of New South Wales and Victoria in the ratio 2:1.

OPERATION AND MAINTENANCE

Under the terms of the 'Agreement', the Snowy Mountains Council was established. One of the main duties of the Council is to direct and control the operation and maintenance of the permanent works of the Authority for the control of water and production of electricity. The Council consists of eight members; the Chairman and Deputy Chairman representing the Commonwealth, two representatives appointed by the State of New South Wales, two representatives appointed by the State of Victoria and the Commissioner and one other member appointed by the Authority. Since the first meeting in 1959, the State representatives have been appointed from the respective Electricity and Water Commissions.

Directions by the Council are carried out by an Operations Engineer and two Assistant Operations Engineers appointed by Council. The Operations Engineer is nominated by the Authority and an Assistant Operations Engineer is nominated by each of the Electricity Commissions of New South Wales and Victoria.

Operation of the Scheme with appropriate provision for maintenance is coordinated through a series of interlocking operating plans with the objective of optimising the use of water for irrigation and electricity production within legal and physical characteristics of the Scheme. The plans are prepared by officers of the Authority and the Electricity and Water Commissions for consideration by Council.

Daily operation of the Scheme is scheduled from a Works Operation Centre in Cooma with the main State Electricity Control Centres at Richmond in Victoria and Carlingford in New South Wales. Instructions for operations are passed from the Works Operations Centre to Regional Control Centres located within the Scheme for physical implementation.

Releases from the Scheme into the Murray River come under the control of the River Murray Commission which apportions the water between New South Wales, Victoria and South Australia. Most of the water released into the Tumut River is used by New South Wales for irrigation in the Murrumbidgee Valley.

At the end of June 1985, the number of personnel employed in the Operation and Maintenance of the Scheme was 727, comprising 657 Authority personnel, 47 from the Electricity Commission of NSW and 27 from the State Electricity Commission of Victoria. Under the 'Agreement', the generating stations of the Scheme are manned by Electricity Commission personnel.

PERFORMANCE OF THE SCHEME

In the formative years of the Scheme, there were critics of its long-term economic viability in view of projected reductions in the cost of production from thermal plant as a consequence of increases in thermal efficiencies and the construction of large thermal plants adjacent to coalfields. As events have proved, the investment in the Scheme for hydro-electricity generation alone has been of great value. This arises firstly from the fact that a large proportion of the costs of hydro works are in the civil works such as dams and tunnels, etc., which have extremely long economic lives compared with thermal plants, and the fact that the operational costs are relatively low, whereas thermal plant have continuing fuel costs which are subject to the effects of changing economic conditions.

In 1984-85, the average cost of energy production by the Scheme was 2.1 cents per kilowatt hour being less than half the cost of electricity sold to bulk consumers by the Electricity Commission of New South Wales and Victoria in that year.

The connection of the Scheme since 1959 by 330 kV transmission lines to the electricity systems of New South Wales and Victoria has also been of significant economic advantage. This has enabled sharing of reserves and the interchange of electricity between New South Wales and Victoria to their mutual advantage in optimising system costs.

Extensive use has also been made of the power and pumping stations of the Scheme to provide spinning and fast reserve for both States from interrupting pumping, partially loaded units, changeover from synchronous condenser operation and the ability to start hydro units quickly with consequent savings in fuel costs of thermal plants.

When the Scheme reached its designed capacity of 3,740 MW in 1974, this figure represented 33 per cent of the capacity of the combined New South Wales, Victoria and Snowy systems, and during shortages of thermal generating plant the Scheme has been called upon to operate at the limit of the diversion capacity available.

The Scheme was designed to produce peak electricity, and good flexibility exists on a short-term basis although it is not able to replace base load generation for prolonged periods. Some increase in the diversion capacity of the Scheme may have been of advantage, but channel capacity of the rivers below the outlets of the Scheme as well as irrigation considerations limit prolonged, high discharge operation.

Because of the high degree of regulation of water available through Lake Eucumbene, a firm minimum release of water equivalent to 85 per cent of average releases is available each year. This release not only allows firm planning for electricity production but also for irrigation.

The regulation of water provided by the Scheme played an important part to mitigate the effect of very severe droughts in 1967-68 and in 1982-83 in the irrigation areas of south-eastern Australia. In 1982-83, the storage in the Scheme was reduced to 18 per cent of capacity and natural inflows to some irrigation catchments were described as being substantially below those previously recorded over some 100 years of available records.

The Scheme, however, has not been without its problems, the most significant of which was a collapse of an unlined section of the Eucumbene-Snowy Tunnel in 1970.

Major electrical and mechanical plants have performed well, but as some of this equipment has been in operation for 30 years, the time has come where replacements can be necessary. This situation also applies to communication and control systems where arrangements are in hand for replacement with high technology systems now available.

CONCLUSION

It may still be too early to assess the true significance of the construction of the Snowy Scheme particularly in regard to the inland diversion of waters. However, the Scheme has demonstrated its value in producing peak hydro-electricity, in conjunction with generating plants of predominantly thermal generators, and the objective of increasing regulated supplies of water to the Murray and Murrumbidgee Valleys.

Construction of the Scheme has also brought new skills to Australia and greatly enhanced the recreation facilities in the Snowy Mountains area. The social impact of the Scheme on the region has also no doubt been significant on the increase in size and prosperity of towns serving the area.

This page last updated 23 November 2012